REMARKS

This amendment is responsive to the Office Action of July 28, 2005. Reconsideration and allowance claims 1-27 and 31-52 are requested.

The Office Action

Claims 1-27, 43, and 44 stand allowed.

Claims 31-34, 39-42, 45, 48-50, and 52 stand rejected under 35 U.S.C. § 102 as being anticipated by Komori (JP 04-370379).

Claims 35-38, 46, and 47 stand rejected under 35 U.S.C. § 103 as being unpatentable over Komori.

MPEP § 2144.03

The applicants respectfully traverse the Examiner's assertion regarding legal precedence in the rejection of claims 35-38, 46, and 47, and pursuant to MPEP § 2144.03. Pursuant to MPEP § 2144.03, the applicants call upon the Examiner to cite a reference which shows that the allegedly obvious choice of design is not only known and operative in vacuum pumps, but also provides motivation for the claimed substitution.

Independent claim 31 calls for a lobe on one rotor and a channel on the other which trap and compress gas in a suction section therebetween. The cited Komori reference includes a cylindrical unit **3** which is illustrated in the form of a circularly helical rib. It is submitted that changing the helical rib of the cylindrical unit **3** from cylindrical helix to V-shaped (claims 35, 36, and 46) or radius-shaped (claims 37, 38, and 47) sections would so change the operation and function of the Komori device that it is not only beyond a mere choice of design, but also raises issues as to equivalents and functionality, and the like. An early citation of appropriate supporting references is requested.

Objections to the Specification And claims 31, 40, 41, 48, 51, and 52

The Examiner inquires regarding the antecedent basis for first and second rotors having grooves. The Examiner's attention is drawn to helical chambers, cells, or grooves **47** in the Figures. Regarding the Examiner's objection to "common

pumping chamber", the Examiner's attention is directed to the only illustrated pump chamber **12**. Regarding the male and female portions, the Examiner's attention is directed to the male lobes or portions **142** and **153** and the female channels or portions **143** and **152**.

"Lobe" Has an Established Meaning in the Vacuum Arts

The applicant directs the Examiner's attention, for example, to pages 174-175 of "Theory and Practice of Vacuum Technology" which shows how "lobe" is understood by persons skilled in the vacuum technology arts. This citation is for definitional purposes to illustrate that which is known and understood to those in the vacuum technology arts.

It is clear from this citation and the way "lobe" is known and understood familiar with the vacuum arts that a helical screw is not a lobe.

The Prior Art

Komori discloses a screw vacuum pump A in combination with a high vacuum pump B. The screw vacuum pump serves as at atmospheric pressure side pump (outlet side pump). The high vacuum pump B serves as a low pressure side pump (inlet side pump). The high vacuum pump B includes two rotors, each cylinder equipped with spiral rib or threads **3** and spiral thread recesses **17**. Both the spiral threads and the spiral recesses of the cylinder have circular cross sections. Figure 4 illustrates an embodiment in which the threads **3** extend into the recesses **17** of the other rotor, but the threads of the two rotors do not mesh or seal or engage with each other.

It will be noted that the threads are well-spaced from the inlet **10** and, in the embodiment of Figure 4, terminate above the meshing threads of the screw vacuum pump A. Indeed, the helical ribs and recesses **17** define open, helical channels through which, if the rotors stop rotating, gas is free to pass.

The Present Application

In the embodiments illustrated in the present application, each rotor of the inlet side pump stage has a non-circular element that is equipped with both a lobe or

male portion and a channel or female portion. The female portion has the negative, non-circular profile of the male portion. The lobes and channels function as positive displacement pumps to compress gas into the helical cells of the screw pump section. This increases the gas removal efficiency.

Claims 31-34, 39-42, 45, 48-50, and 52 Are Not Anticipated By Komori

Claim 31 calls for a lobe mounted to the first rotor. Helical threads **3** of Komori are not "lobes" as used and understood in the vacuum arts.

Claim 31 further calls for the first and second rotors to include a lobe and channel which cooperate to form a suction section adjacent the inlet port which is intermittently closed from the inlet port. In Komori, the threads **3** do not at any time close the inlet port **10**. Rather, the inlet port **10** of Komori is always open.

Claim 31 further states that during rotation of the rotors, gas is trapped in the suction section between the lobe and channel and in a directly connected portion of at least one of the helical cells. By contrast, both ends of the recesses **17** defined between the threads **3** of Komori are always open at both ends. Gas is not trapped in this region.

Claim 31 further states that with continued rotation, the suction gas trapped in the suction section is directly compressed into at least one helical cell. Pumping section B of Komori does not directly compress gas into helical cells of the screw pump A.

Accordingly, **claim 31 and claims 32, 35-37, and 42 dependent therefrom** are not anticipated by Komori.

Claim 39 calls for a vacuum pump in which a lobe is mounted to one rotor. Threads **3** of Komori are not lobes.

Further, claim 39 calls for the lobe and a channel in the other rotor to cooperate to form a suction section which compresses the gas. By distinction, in Komori, gas is not compressed by an interaction of the threads **3** and the recesses **17** of high vacuum section B. In a high vacuum pump, one can visualize the sparse gas molecules as sparse ping-pong balls which are bounced off the rotor threads primarily toward the outlet.

Further, claim 39 calls for this suction section to be in direct communication with the screw section. By contrast, in Figure 4 of Komori, there is a space between these threads **3** of section B and the threads of screw section B and the threads of screw section A. Not only is the open helical spaces defined between the threads **3** of Figure 4 of Komori and the recesses **17** open at both ends so as not to form a suction section, but these open at both ends helical regions are not in direct communication with the screw section A.

Further, claim 39 calls for the lobe to extend less than fully circumferentially around the rotor. In Komori, the threads **3** spiral around the rotor.

Accordingly, it is submitted that **claim 39** is not anticipated by Komori.

Claim 40 calls for a non-helical lobe. The helical threads **3** of Komori are neither lobes nor non-helical.

Accordingly, **claim 40 and claim 33 dependent therefrom** are not anticipated by Komori.

Claim 41 calls for the male and female portions to cooperate to form a positive displacement suction section. The open threads 3 of Figure 4 of Komori do not form a positive displacement suction section.

Accordingly, **claim 41 and claim 34 dependent therefrom** are not anticipated by Komori.

Claim 45 is directed to a method in which suction gas is received through an inlet port after which the inlet port is closed with a lobe trapping the gas in the suction section. The inlet **10** of Komori is never closed by threads **3** to trap gas.

Further, claim 45 calls for the suction section to compress the gas directly into the screw section. By contrast, the threads **3** are spaced from the screw section A of Figure 4 of Komori to define open helical paths between the inlet **10** and the screw section A.

Accordingly, **claim 45 and dependent claims 46-47** are not anticipated by Komori.

Claim 48 calls for a male portion and a female portion having a complementary negative profile to the male portion. Wide recesses **17** are not complementary negative profiles to narrow threads **3** of Komori.

Further, claim 48 calls for the male and female portions to inter-engage to form a suction section which is disposed in direct communication with the screw pump. Komori does not define a suction section, much less a suction section in direct communication with the screw pump A.

Claim 48 further calls for the male portion to open and close the inlet port. Threads **3** of Komori do not open and close the inlet **10**.

Accordingly, **claim 48 and claims 49-51 dependent therefrom** are not anticipated by Komori.

Claim 52 calls for receiving gas in a suction section and closing the inlet port with a male lobe. Komori, Figure 4, does not have male lobes which close the inlet port **10**.

Further, claim 52 calls for the gas to be trapped in the suction section. The helical channels in high vacuum pump B of Komori do not close at either end.

Accordingly, it is submitted that **claim 52** is not anticipated by Komori.

Claims 35-38, 46, and 47 Are Not Unpatentable Over Komori

Claim 35 calls for the lobe to be V-shaped. The thread **3** of Komori is helically shaped. There is no suggestion or motivation in Komori to replace the helix **3** with a V-shaped lobe. As stated above, the applicants challenge the Examiner's assertion that helical threads and V-shaped lobes are equivalent choices of design and put the Examiner to her proofs to cite a reference in support of the assertion.

Claim 36 further calls for the channel to be V-shaped. The applicants again challenge the Examiner's assertion that refashioning the wide flat helical recess **17** from a helix into a V-shape is a mere matter of choice. In Komori, stage B is a high vacuum pump. That is, individual gas atoms interact with the rotating threads and are deflected or bounce, analogous to a ping-pong ball, when the rotating threads strike the gas molecule. The configuration of the threads is carefully configured to "bounce" more of the gas molecules toward stage A than back towards the inlet **10**. Random changing the helical thread and recess can alter the effectiveness of a high vacuum pump in ways in which Komori provides no motivation. Accordingly, it is submitted that **claim 36** is not obvious over Komori.

Claim 37 calls for the lobe to be radius-shaped and **claim 38** calls for the channel to be radius-shaped. Again, it is submitted that there is no motivation in Komori and that it not generally recognized in the art that the claimed radius-shaped lobes and channels are the recognized equivalent of helical threads **3** in the high vacuum pumping stage B of Komori and puts the Examiner to the task of providing a reference to this effect as provided MPEP § 2144.03.

Claim 46 calls for the lobe and channel which trap and compress the gas to have V-shaped sections. The helical threads **3** and recesses **17** of Komori do not trap and compress the gas. It is submitted that changing helical threads and channels into a lobe and channel with V-shaped cross sections to achieve this different function is a change of operating principle, not a mere matter of choice of design. Accordingly, it is submitted that **claim 46** is patentable over Komori.

Claim 47 calls for the lobe and channel to be in the form of radius-shaped sections which trap and compress the suction gas. It is submitted that changing a helical thread and recess which does not trap and compress gas into radius-shaped lobes and channels to achieve this function is not a mere matter of choice of design, but rather is a change of design achieving a change in function. Accordingly, it is submitted that **claim 47** is patentable over Komori.

Telephone Interview

The undersigned would be pleased to discuss the claims with the Examiner in order to expedite an early allowance of the present application.

CONCLUSION

For the reasons set forth above, it is submitted that claims 1-27 and 31-52 are not anticipated by or obvious over Komori or the other references over the references of record. An early allowance of all claims is requested.

Respectfully submitted,

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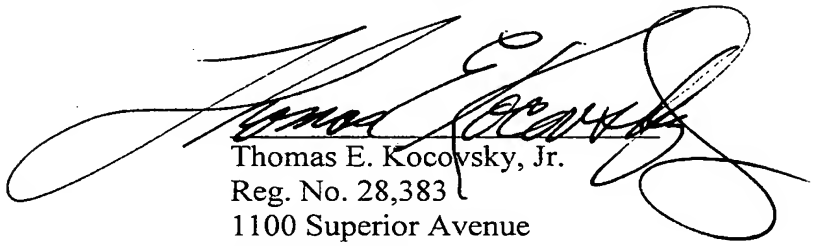

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